

Amendment and Response Under 37 C.F.R. §1.116 - Expedited Examining Procedure

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Serial No.: 09/647,475

Confirmation No.: 7111

Filed: August 20, 2001

For: COMPOSITE DEVICES INCORPORATING BIOLOGICAL MATERIAL AND METHODS

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**Amendments to the Claims**

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral imbedded component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~; and wherein the biological material is metabolically active or becomes metabolically active upon hydration.
2. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~; and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure comprises at least one layer comprising a porous latex-derived material and at least one layer comprising a nonporous latex-derived material.
3. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~; and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the nonporous material defines at least one channel or at least one well.
4. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a

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portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure comprises no greater than about 75% by volume biological material.

5. (Original) The composite device of claim 4 wherein the biostructure comprises no greater than about 50% by volume biological material.
6. (Currently Amended) The composite device of claim 1 wherein the biological material comprises a prokaryote, a eukaryote, an archaean organism, or a combination thereof.
7. (Currently Amended) The composite device of claim 1 wherein the biological material comprises a mammalian cell, a blood cell, an avian cell, a plant cell, an insect cell, a bacteriophage, a spore, a virus, or a combination thereof.
8. (Currently Amended) The composite device of claim 1 wherein the biological material comprises a recombinant bacterial, yeast, or fungal cell.
9. (Previously presented) The composite device of claim 8 wherein the recombinant cell is desiccation tolerant.
10. (Original) The composite device of claim 1 wherein the biostructure further comprises at least one additive selected from the group of a salt, a pigment, an adsorbent, a liquid crystal, a porosity modifier, a chelating agent, a nutrient, a surfactant, a dye, a photoreactive compound, an antibiotic, an antimicrobial, a bacteriostatic compound, an enzyme, an osmoprotectant, a biopolymer, a metal, a chemical catalyst, and a combination thereof.

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11. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure further comprises a transmitter incorporated therein.

12. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure further comprises a detector incorporated therein.

13. **(Original)** The composite device of claim 12 wherein the detector senses a response emitted from the biological material when in contact with an analyte.

14. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure comprises a cross-linked latex-derived polymer.

15. **(Previously presented)** The composite device of claim 1 wherein the biostructure is non-hydrated and the biological material becomes metabolically active upon hydration.

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16. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure further comprises a porous latex-derived material.
17. **(Original)** The composite device of claim 16 wherein the porous latex-derived material comprises a mixture of latices.
18. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the composite device further comprises a substrate on which the biostructure is disposed.
19. **(Original)** The composite device of claim 18 wherein the substrate comprises a membrane, a filament, or a wire.
20. **(Original)** The composite device of claim 18 wherein the substrate comprises a metal or a polymeric material.
21. **(Original)** The composite device of claim 18 wherein the substrate is an electronic device.

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22. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~; and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and wherein the biostructure comprises wires or electrodes.
23. **(Original)** The composite device of claim 1 wherein the biostructure is no greater than about 500 microns thick.
24. **(Original)** The composite device of claim 1 wherein the entire device is no greater than about 500 microns thick.
- 25-47. **(Canceled)**
48. **(Original)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 1, wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.
- 49-99. **(Canceled)**
100. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 2, wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

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101. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 3, wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

102. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 4, wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

103. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 11 wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

104. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 12 wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

105. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 14 wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

106. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 16 wherein, upon contact

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with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

107. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 18 wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

108. **(Previously presented)** A method of determining the presence of an analyte in a sample, the method comprises contacting the sample with the device of claim 22 wherein, upon contact with the analyte, the biological material produces a response and emits a signal; and detecting the signal.

109. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral imbedded component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration, and further wherein the biostructure comprises a porous sealant layer that does not include biological material.

110. **(Currently amended)** A composite biological device comprising a biostructure comprising at least one biological material as an integral, imbedded, permanently trapped, component thereof, wherein at least a portion of the biostructure comprises a nonporous latex-derived material ~~formed by coalescence of latex-derived polymer particles~~, and wherein the biological material is metabolically active or becomes metabolically active upon hydration.